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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,895	07/18/2006	Yusuke Konagai	YAMA:127	3484

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EXAMINER	
PAUL, DISLER	

ART UNIT	PAPER NUMBER
2615	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/579,895	KONAGAI ET AL.	
	Examiner	Art Unit	
	Disler Paul	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/20/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-9, 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Eberbach (US 5,809,150).

Re claim 1, Eberbach disclose of the array speaker apparatus in which sounds radiated with directivities from a plurality of speaker units in accordance with an audio signal are reflected by wall surfaces so as to generate a virtual sound source, comprising: first radiation control means for driving the speaker units so that sounds corresponding to a first audio signal of each main channel are radiated to the wall surfaces on the left and right sides of a listening position; and second radiation control means for driving the speaker units so that sounds corresponding to a second audio signal the same as the first audio signal are radiated directly to the listening position (fig.1,3,5; col.6 line 15-32/sound from each driver goes to listener and reflect at wall).

RE claim 2, the array speaker apparatus according to claim 1, comprising means for correcting one or both of a frequency-gain characteristic and a frequency-phase characteristic of at least the first audio signal out of the first audio signal and the second audio signal so that sounds arriving at the listening position have desired properties (fig.7b; col.8 line 15-45/method to adjust the frequency characteristic).

Re claim 3, Eberbach disclose of the array speaker apparatus in which sounds radiated with directivities from a plurality of speaker units in accordance with an audio signal are reflected by wall surfaces so as to generate a virtual sound source, comprising: a high pass filter for extracting a first audio signal of a middle/high frequency band from an input audio signal of each surround channel; a low pass filter for extracting a second audio signal of a low frequency band from the input audio signal (fig.1,3,5; fig.7; col.8 line 1-25/speakers with high and low frequency driver); first radiation control means for driving the speaker units so that sounds corresponding to the first audio signal are reflected by the wall surface behind a listening position and then reach the listening position; and second radiation control means for driving the speaker units so that a sound pressure level of sounds corresponding to the

second audio signal reaching the listening position is smaller than a sound pressure level of sounds corresponding to the first audio signal reaching the listening position (fig.1,3; col.3 line 15-40; col.7 line 40-46).

RE claim 4, the array speaker apparatus according to claim 3, wherein: assuming that a spatial point where sounds radiated from the plurality of speaker units arrive simultaneously is regarded as a focus, the first radiation control means and the second radiation control means drive the speaker units so that a focus of sounds corresponding to the second audio signal is set to be farther than a focus of sounds corresponding to the first audio signal (Eberbach, fig.6B/ with virtual (80) and real (64))).

Re claim 5, the array speaker apparatus according to claim 3, wherein: the first radiation control means and the second radiation control means drive the speaker units so that an angle between a radiation direction of sounds corresponding to the second audio signal and a frontal direction of the array speaker apparatus is larger than an angle between a radiation direction of sounds corresponding to the first audio signal and the frontal direction (fig.7 wt low (82,84) and high (88); col.8 line 1-6).

Re claim 6, Eberback disclose of the array speaker apparatus with a plurality of speaker units, comprising: a first audio signal generating circuit that generates first audio signals based on an input audio signal; a second audio signal generating circuit that generates second audio signals based on the input signal (fig.1,3,5,7; ; col.8 line 1-25) adders that add the first audio signals to the second audio signals and input addition results to the plurality of speaker units (col.6 line 57-62/speaker channels can be combined for plurality of drivers); and a directivity control unit that controls directivities of first output sounds output by the plurality of speaker units based on the first audio signals, and directivities of second output sounds output by the plurality of speaker units based on the second audio signals (col.5 line 64 & col.65 line 32; col.6 line 15-39; col.7 line 30-50).

Re claim 7, the array speaker apparatus according to claim 6, wherein: the first audio signal generating circuit and the second audio signal generating circuit include delay circuits for delaying input signals, respectively; and the directivity control unit controls the delay circuits so as to realize the directivities of the first output sounds and the directivities of the second output sounds (col.8

line 45-52; col.4 line 1-4; /drivers include delay to control directivity).

Re claim 8, the array speaker apparatus according to claim 7, wherein the first audio signal generating circuit and the second audio signal generating circuit further include characteristic correction circuits for performing desired characteristic correction upon the input signals, respectively (fig.7b; col.8 line 15-45/method to adjust the frequency characteristic).

Re claim 9, the array speaker apparatus according to claim 8, wherein the characteristic correction circuit of the first audio signal generating circuit includes a high pass filter, and the characteristic correction circuit of the second audio signal generating circuit includes a low pass filter fig.7b; col.8 line 15-45/method to adjust the frequency characteristic).

Re claim 12, Eberbach disclose of the array speaker apparatus with a plurality of speaker units, comprising: a delay circuit that delays an input signal by delay times set for the speaker units respectively; a directivity control unit that controls the delay times of the delay circuit so as to determine directivities of output sounds output by the plurality of speaker units (col.8 line 45-52; col.4 line 1-4); and filters that are provided for the speaker units respectively, and

filter outputs of the delay circuit and output the filtered outputs to the speaker units; wherein cut-off frequencies of the filters are different from one another (fig.1,3,5; fig.7; col.8 line 1-25).

Re claim 13, the array speaker apparatus according to claim 12, wherein each of the cut-off frequencies of the filters is set to be lower as a speaker unit corresponding thereto is located at a larger distance from a center of the array speaker (fig.7b; col.7 line 1-40/ with low frequencies and high frequency driver respectively).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eberbach (US 5,809,150) and further in view of Kawano (US 6,816,597 B1).

Re claim 10, the array speaker apparatus according to claim 9 with the first and second signal generating circuit, However, Eberbach

fail to disclose of the wherein the signals include multipliers for adjusting signals delayed by the delay circuits into desired levels, respectively. But, kawano disclose of a system wherein the signals include multipliers for adjusting signals delayed by the delay circuits into desired levels, respectively (fig.1-6; col.1 line 20-25 & line 50-57; col.3 line 65 & col.4 line 8) for the purpose of setting the factor coefficient signal to achieve the proper stereophonic feeling. Thus, taking the combined teaching of Eberbach and Kawano as a whole, it would have been obvious for one of the ordinary skill in the art to have modify Eberbach by incorporating the signals include multipliers for adjusting signals delayed by the delay circuits into desired levels, respectively for the purpose of setting the factor coefficient signal to achieve the proper stereophonic feeling.

Re claim 11, the array speaker apparatus according to claim 10, wherein: the multipliers are provided for the speaker units, respectively (kawano, fig.1-2,4 wt (1,R); col.7 line 1-10); with the gain coefficient of the multiplier of the signal (kawano,col.5 line 50 & col.6 line 15). However, the combined teaching of Eberbach and Kawano as a whole, fail to disclose of the wherein the gain coefficient being zero. However, official notice is taken the concept of having a gain coefficient being zero is simply the inventor's preference, thus it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modify the

combined teaching of Eberbach and Kawano as a whole, by incorporating the specific wherein the gain coefficient being zero for minimizing certain processing method.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

These prior art disclose of the array of speakers with directivity control with delay with sound directing toward listeners and walls to create virtual speakers: Fukuhara et al. (US 6,343,132 B1) and Lim (6,005,947) and Croft (US 5,109,416) and Moorthy (US 2004/0013271 A1) and kimura et al. (US 6,169,806) and Norris et al. (US 7,298,853 B2).

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Disler Paul whose telephone number is 571-270-1187. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DP

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